

ABSTRACT

A method for forming a passivated metal layer that preserves the properties and morphology of an underlying metal layer during subsequent exposure to oxygen-containing ambients. The method includes providing a substrate in a process chamber, exposing the substrate to a process gas containing a rhenium-carbonyl precursor to deposit a rhenium metal layer on the substrate in a chemical vapor deposition process, and forming a passivation layer on the rhenium metal layer to thereby inhibit oxygen-induced growth of rhenium-containing nodules on the rhenium metal surface.